DTU's Research Data Management Policy

Content

1. Preamble

The Technical University of Denmark (DTU) is internationally recognized for its elite polytechnic research. DTU's management and digitization of facilities, functions and research data must support that all research units at DTU appear trustworthy, with high integrity and with a focus on both transparency and accountability.

Responsible conduct of research includes proper management of research data. Proper management of research data is characterised by following relevant guidelines and legislation, securing resources for collection, processing, analysis and documentation of data, and by planning storage and sharing throughout the data life cycle. DTU supports the *National Strategy for data management based on the FAIR principles 2021*. Research data management according to the FAIR principles[1] ensures that data are findable, accessible, interoperable and

[1] FAIR principles www.bibliotek.dtu.dk/researchdatamanagement/policy

reusable. Hence, proper research data management enables research to be more efficient and open.
For the individual researcher, good data management can lead to improved visibility and impact of their research, for example by facilitating the reuse of their data and by securing transparency of the research process.

1.1 Purpose

The intention of the policy is to support departments, researchers and research support staff by outlining the requirements for the management of research data and enable researchers and students to follow good scientific practice within their discipline, while adhering to national laws and policies applicable to research data. Research data management is the practise of how to handle research data during planning and executing the research project, as well as beyond the life of the research project. DTU is committed to the highest standards of excellence in research and will support the competences necessary to adhere to this policy through infrastructure integration, training, support, guidelines and tools for research data management,

1.2 Scope

This policy applies to staff, students, visiting researchers and honorary and adjunct appointees undertaking or supporting research activities at all DTU locations as well as external research locations.

This policy applies to research data that has been created, collected and/or used during DTU research activities, including materials, records and datasets, held in all forms, formats and media.

1.3 Definitions

Research data is the material, records, files, and other evidence underpinning the research projects' findings, or other outcomes. This includes:

- *Primary material* is any material (e.g., specimens, laboratory notebooks, interviews, texts and literature, digital raw data, recordings and any other records including computer code necessary for the reconstruction and evaluation of reported results of research, and the events and processes leading to those results) that forms the basis of the research.

- *Data* are detailed records of the primary materials that comprise the basis for the analysis that generates the results.

2. General principles

2.1 Data Management Plans (DMP)

2.1.1 The management of research data must be thoroughly considered before physical materials and digital data are collected, created or reused. Data management plans (DMPs) must be developed and documented, preferably in electronic formats. As a minimum, the topics addressed in this policy must be reviewed, for example by using the DTU DMP templates. DMP's should be updated when significant changes to the management of research data occur and (references to) the DMP should be stored with the corresponding research data as long as they exist.

2.1.2 The DMP should be discussed with project collaborators, research managers and supervisors (if any), ensuring that agreements are reached regarding responsibilities for different research data management activities during and after research projects.

2.2 Rights to research data[2]

2.2.1 Rights to research data must be clarified at the start of research projects. Unless legislation states otherwise, or agreements have been made to determine otherwise, the following is the default at DTU:

a. In accordance with the general rules of copyright during employment, researchers hold the copyright to books and articles they publish as a result of research projects carried out at DTU.[3]
b. DTU holds the copyright to software created by employees during the performance of their work.
c. DTU holds the rights to research data in the shape of physical materials collected by researchers during their employment at DTU, such as biological, chemical and geological samples, notebooks, paper interviews and books. These objects may not be removed without permission.
d. Data sets and associated metadata must remain at DTU when employment ceases. As a minimum, this applies to data sets underlying publications and patent applications (if any). The data must be documented so it is understandable to peers. (See also 2.4.1 and 2.4.2)
e. In accordance with the Danish Act on Inventions at Public Research Institutions, DTU has the right to acquire researchers' inventions and to ask researchers to postpone publication of such inventions for a certain period. This to be agreed in a mutual dialogue between concerned parties.

In addition, the following should be clarified at the start of the project:

f. To what extent research data can be accessed in the project. For example, in projects involving personal data, it must be clarified to what extent rules of data confidentiality or

[2] DTU Compliance Timeline www.bibliotek.dtu.dk/researchdatamanagement/policy
[3] Publication policy www.bibliotek.dtu.dk/researchdatamanagement/policy

limitations in data processor agreements impose limits on data access and use, and how these limits will be upheld.

g. Who can access and manage the research data, within which timeframe and for what purpose (civil, military or both).
h. When and to what extent research data may be used for other purposes, for example in other research projects. It should also be determined what rules apply if a project member leaves the project and/or DTU.
i. Whether research data can be shared after project end, and if so, what the terms of data reuse by others will be.
j. Intellectual property rights, including whether the research project makes use of material that interferes with the rights of others, and how the necessary approvals should be obtained to clear these rights.
k. The legislation, policies or agreements governing the above, including whether there are special loyalty or confidentiality obligations.
l. Any research data management requirements by research funders, partner organisations, etc.

2.3 Ethical and legal approvals

2.3.1 It should be ensured that the appropriate ethical and legal approvals are obtained before the start of data collection and (references to) the approvals should be stored along with the research data, as long as they exist.

2.3.2 Strict legal and local requirements exist for projects involving personal data. Among others, projects in which personal data are being processed (including biobanks) must be registered at DTU, the registration must be filed in the University's archiving system. Certain activities also require the approval from the data protection authorities (e.g. Danish Data Protection Agency). Conditions for transfer of personal data and material between DTU and external collaborators or a third party must be captured into agreements. The local GDPR Coordinator can provide further information.[4]

2.4 Collection, processing and documentation

2.4.1 Research data should be collected and processed in line with best practice in the research discipline. Research projects should be documented in a way that allows them to be repeated by others. Among other things, this includes clearly and accurately describing research methodology and any equipment, software or code used.

2.4.2 Research data should be described using appropriate metadata to facilitate searching for, the identification of, and the interpretation of the research data. Metadata should be linked to the research data as long as they exist, unless legislation or agreements state otherwise.

[4] GDPR www.bibliotek.dtu.dk/researchdatamanagement/policy

2.5 Storage and security

2.5.1 Research data must be categorized at the start of a research project based on the level of sensitivity and the impact to the University if data are disclosed, altered or destroyed without authorisation. Risks related to data security and to the data loss should be assessed in relation to the data classification. This includes evaluating:

a. Physical and digital access to research data

b. Risks associated with data management procedures

c. Backup requirements and backup procedures

d. External and internal threats to data confidentiality, integrity and accessibility

e. Financial, regulatory and technical consequences of working with data, data storage and data preservation.

2.5.2 Risks to data subjects' rights and freedom must be assessed in projects involving personal data and a risk assessment must be conducted and recorded when registering projects at DTU. In some cases, with a high risk for the data subjects, a Data Protection Impact Assessment (DPIA) must also be carried out as part of the registration process.

2.5.3 Infrastructure for storing and processing research data, and for collaborating in research projects, must be chosen in accordance with the identified risks, and in compliance with DTU's Information Security Policy and the legal requirements for processing personal data.

2.6 Data sharing and publication

2.6.1 Legislation or agreements may preclude research data sharing or impose conditions for sharing. Before sharing research data, the relevant approvals need to be obtained and, if necessary, the appropriate agreements set up to allow data and material sharing.

2.6.2 By default, research data should be made openly available after project end, as a minimum for data sets underlying research publications. Concerns relating to intellectual property rights, personal data protection, information security as well as commercial and national interests and legislation must be taken into account. Thus, data sharing should be in accordance with the principle of 'as open as possible, as closed as necessary'. If the research data cannot be made available, sharing the metadata associated with the research data must be considered.

2.6.3 The FAIR principles (for findable, accessible, interoperable and reusable research objects) should be followed as much as possible when preparing digital data sets. This includes as a minimum:

a. Providing open access to data (Open Data) by depositing (meta)data in a data repository, or by providing access to information on whether, when, how, and to what extent data can be accessed if data sets cannot be made openly available.
b. As much as possible using persistent identifiers (PID) and metadata (such as descriptive keywords) that help locate the data set.
c. Communicating terms and conditions for data reuse by others, for example by attaching a data license.
d. Providing the information necessary to understand how data sets were created and structured, and for what purpose. The level of compliance with the FAIR principles, in addition to the minimum requirements described above, is defined by the individual research discipline in relation to international norms and standards in that discipline.
e. DTU's general legal entity must be involved as early as possible in the negotiation of all third-party contracts containing provisions on intellectual property rights, such as non-disclosure agreements, material transfer agreements and collaboration agreements. Patentable inventions must be reported to the DTU's general legal entity in accordance with the Act on Inventions at Public Research Institutions.[5]
f. Determining rights, for example, of access to and use of preserved data sets.

2.7 Long-term preservation

2.7.1 Appropriate arrangements for the long-term preservation of digital data, physical material and associated metadata must be made, adhering to national legislation and/or project agreements. This should include:

a. Deciding which research data will be preserved. As a minimum, data sets underlying published research results must be preserved so that any objections or criticisms can be addressed.
b. Deciding how long research data will be preserved. Data sets underlying research publications should be retained for at least five years after project completion or date of publication, whichever comes last.
c. Choosing a format and location in which research data should be preserved and deciding what metadata should be associated with the preserved data and material.
d. Deleting/destructing research data if legislation or agreements exclude preservation, or when researchers and their managers determine that preservation is not required (for example when research data can easily be reproduced) or not possible (for example when research data are too costly to store or when material quality will deteriorate over time).
e. Appointment of one or more persons or roles as responsible for research data after the end of the project. This includes, among other things, securing the integrity of the data for long term preservation
f. Determining rights, for example, of access to and use of preserved data sets.

[5] Legal www.bibliotek.dtu.dk/researchdatamanagement/policy

2.7.2 Data sets and associated metadata must remain at DTU after project end and/or when employment with the University ceases, in a way in which they are accessible to research leaders and understandable for research leaders and peers, unless legislation or agreements determine otherwise. As a minimum, this applies to data sets underlying publications. Responsibilities for and rights to these data sets must be agreed upon.

2.7.3 Digital research data must be registered to the Danish National Archives at project end if the research falls within the scope of the *Executive Order on the Registration of Digital Research Data* #514[6]. The Danish National Archives assess the data's potential for long-term preservation. The National Archives may subsequently request a copy of the data to be transferred to the archives. Data in these projects can only be destructed if the National Archives issue a disposal provision after their assessment.

2.7.4 Personal data can only be preserved

a. if anonymized or
b. at the Danish National Archives or
c. when there is a legal basis for the long-term preservation of personal data in a secure database, biobank or other collection for research purposes.

2.7.5 A plan for research data preservation and/or destruction must be developed in alignment with legislation, (local) guidelines and agreements (if any), and the continued need for preservation should be reviewed on a regular basis.

3. Roles and Responsibilities

DTU acknowledges the importance of ensuring that all research data are managed so that they are secure, accessible, and, where appropriate, reusable, and so that any ethical, confidentiality and privacy requirements and concerns are respected. The responsibility is shared between:

3.1 DTU Executive Board

The DTU Executive Board is responsible for:

a. *Infrastructure:* Ensuring that the basic infrastructure necessary to enable good research data management and to facilitate adherence to this policy is available at DTU.
   - *Data storage*: DTU must provide a storage system that allows researchers to manage their data responsibly. Such a storage system includes: storage space, access control, and back-up.

[6] Executive order www.bibliotek.dtu.dk/researchdatamanagement/policy

- *Research Data Catalogue:* DTU must provide and maintain a research data catalogue that enables (meta)data to be findable, accessible and citable.

The Executive Board must also ensure that:

b. Guidelines on, and support in, research data management are available at DTU.
c. Relevant training opportunities are offered.
d. Sufficient expertise and resources are available at DTU for legal counselling related to research data management, privacy and to the negotiation of contracts.
e. Data management expenses are reasonable in relation to the aims of the data management policy and the University's legal obligations, and that consideration is given, at all levels of the organisation, to what resources are needed to achieve these goals.

3.2 Department and Centre Heads

The Department- and Centre Heads, are responsible for:

a. Ensuring that a plan and a timeline for the implementation of this policy are developed at their department/centre.
b. Further clarifying the roles and responsibilities for research data management at their department/centre.
c. Assigning a person, persons or role(s) responsible for the research data after the project ends. Responsibilities include safeguarding the long-term integrity of data sets and ensuring the timely deletion or anonymisation of research data, which is personal data.
d. Ensuring that discipline and/or data type specific guidelines and procedures to supplement this policy are developed where necessary.
e. Ensuring that researchers, supervisors and research leaders use the appropriate training concerning:
    - the costs associated with research data management
    - the legal obligations associated with research data management
    - possible consequences for DTU and for others in case of security and confidentiality breaches and data loss, particularly for projects involving confidential data, including personal data and human biological material.
f. Ensuring that as a minimum develop departmental guidelines for long term preservation of primary materials.
g. Ensuring that researchers, research support staff, and departmental leadership have access to the necessary knowledge about research data management.
h. Based on the available resources providing cost-efficient tools and support necessary to enable good research data management within the available resources, and to facilitate adherence to this policy, seeking collaboration with other departments and the central administration where relevant.

3.3 Research leader / Principal investigator (PI)

For the purpose of this policy, a Research leader / Principal investigator (PI) is defined as a researcher who is the lead researcher on a research project principal investigator (PI) and/or heads a research unit, and/or by delegation has been given similar responsibilities.

Research leader/ PI are responsible for:

a. That researchers and students under their management are instructed to conduct research in accordance with the policy and are made aware of their responsibilities as mentioned in this policy.
b. Ensuring that all members in the projects or the research units that they lead, are aware of the legislation, policies and agreements relevant for their research, including this policy and other DTU policies.
c. Ensuring that conclusions regarding rights to research data are in line with university policy, local guidelines, as well as with legal, ethical and contractual obligations, and for identifying when conclusions need to be captured into written agreements.
d. Involving the local Personal Data Coordinator to ensure that projects in which personal data are being processed (including biobanks) are registered at DTU, and that conditions for transfer of personal data and/or human biological material between DTU and research collaborators or third parties are captured into agreements.
e. Ensuring that data are categorized at the start of research projects, that risks to data confidentiality, integrity and accessibility are assessed, and that infrastructure is chosen accordingly.

3.4 Supervisors

Supervisors are defined as experienced researchers who provide guidance to less experienced researchers or students.

Supervisors are responsible for:

a. Ensuring that the researchers and students under their supervision are aware of the legislation, policies and agreements relevant for their research, including this policy and other DTU policies.
b. Ensuring that researchers and students obtain the necessary knowledge to enable good management of research data, through supervision and/or mentoring.
c. Reviewing the data management activities of the students and researchers they supervise, among other things by discussing their data management plan at the start of research projects.

3.5 Researchers

Researchers are defined as anyone conducting or supporting research activities at DTU, among others including scientific staff, PhD students, visiting and affiliate researchers.

Researchers are responsible for:

a. Adhering to this and other DTU policies, legislations and agreements related to management of data.
b. Conducting the creation of a Data Management Plan.
c. Ensuring that expectations for the management of research data are aligned between themselves and their research managers, supervisors and collaborators (if any).
d. Ensuring that primary materials and data are preserved, stored, shared and managed in a clear and accurate form that allows results to be assessed, the procedures to be retraced and, when relevant and applicable, the research to be reproduced.
e. Deciding, unless otherwise regulated, the extent to and duration for which primary materials and data are to be stored/preserved. When deciding this, researchers should consider the value of the primary materials and data for assessing the results of the research.
f. Planning the appropriate disposal of primary materials and data.
g. Managing the access to their research data and are encouraged to make their research data freely accessible, except when this is in conflict with contractual legal obligations or current regulations on for example ethical, confidentiality or privacy matters or intellectual property rights.
h. Considering the appropriate allocation of resources for research data management in funding proposals and recovering the costs for the management and sharing of research data.

3.6 Research support staff

Research support staff and student employees are responsible for:

a. Adhering to this policy when they manage research data as part of a research project at DTU.

4. Policy process and contact information

The DTU Policy of Data management was prepared by the DTU Research Data Management Forum. It was approved by the DTU Executive Board 12.04.2023 and should be considered for review every five years.

The current document is a revision and replacement of the *DTU Policy of the Retention of Primary Materials and Data, December 2016*. The revision elaborates on the general principles of the previous policy and aim to meet the scope of the *National strategy for research data management based on the FAIR principles 2021*[7]. The policy adheres to existing legislation, the *Danish Code of Conduct for Research Integrity*[8] and supplements other policies at DTU.

Questions about this policy can be directed to datamanagement@dtu.dk. Information about the topics addressed in this policy and contact details for research data management support can be found on the research data management pages on DTU Inside.

[7] National strategy www.bibliotek.dtu.dk/researchdatamanagement/policy